MADROÑO, Vol. 65, No. 1, pp. 60–64, 2018

NOVELTIES IN *MUSINEON* (APIACEAE) AND *ORTHOCARPUS* (OROBANCHACEAE) IN THE NORTHERN WASATCH MOUNTAINS OF UTAH AND IDAHO

LEILA M. SHULTZ
Utah State University, Quinney College of Natural Resources, Logan, UT 84322-5230,
l.shultz@usu.edu

FRANK J. SMITH
Western Ecological Services, P.O. Box 422, Millville, UT 84326-0422

ABSTRACT

Two novelties from the Bear River Range of the northern Wasatch Mountains of Utah and Idaho are *Musineon naomiensis* L. M. Shultz & F. J. Smith, sp. nov. (Apiaceae) and *Orthocarpus holmgreniorum* (T.I. Chuang & Heckard) L. M. Shultz & F. J. Smith, comb. et. stat. nov. (Orobanchaceae). With these additions, the Bear River Range harbors 13 endemic plant species, most of which are edaphically restricted to dolomitic rocks in or near Logan Canyon. Most of the 260+ species of the 2600+ native species on the Utah state list of rare plants are in the warm-desert portion of the state. The montane endemics enumerated here demonstrate the unique habitats of the mountains of northern Utah and distinguish the Bear River Range as a hotspot of rarity.

Key Words: Bear River Range, edaphic endemism, glacial refugia, *Musineon (*Apiaceae*)*, northern Wasatch Mountains, *Orthocarpus (*Orobanchaceae*)*, rare plants, Utah.

Utah is known for its high proportion of narrowly restricted species of flowering plants. More than 10% of its approximately 2700 native species are endemic to the state (Albee et al. 1988; Welsh et al. 2008), making the area one of the richest areas of endemism in North America (Stein et al. 2000). Of the 260 endemic species listed as rare and restricted to unique edaphic substrates (Welsh et al. 1978; Stohlgren et al. 2005; Fertig 2012), the majority are restricted to low elevation habitats with low species diversity (Shultz 1993).

Although mountain endemics are uncommon in Utah (Shultz 1993), the Bear River Range of the northern Wasatch Mountains harbors 13 endemics, eight of which are known only from Logan Canyon. The high concentration of endemics signals the Logan Canyon area as an unusual hotspot of rarity in Utah. The two species described here – one with a new status, the other as a novel species – add to a growing list of endemic species in northern Utah.

Notable among these species is the Maguire primrose (*Primula maguirei* L. O. Williams), the only one of the named local endemics that is currently protected with threatened status (US Fish and Wildlife Service 1985). It shows strong genetic differentiation among closely related species in the *Primula cusickiana* (A. Gray) A. Gray complex, as well as surprisingly high levels of heterogeneity within its small geographic range (Wolf and Sinclair 1997; Bjerregaard and Wolf 2008; Davidson et al. 2014). We can infer from these genetic studies as well as the widespread geographic range of *P. maguirei* (Kass and Welsh 1985; Kelso 1991; Holmgren and Kelso 2001) that it is a glacial relict.

The rare plants of Logan Canyon provide an opportunity to study evolutionary forces leading to relictual endemism, as well as neo-endemism, patterns that can be either anagenetic or cladogenetic (Takayama et al. 2015). The two species described here appear to be closely related species, both nested within species complexes inhabiting mountain ranges of the Intermountain region, which stretches from the Sierra Nevada of California to the Colorado Plateau of Arizona, Colorado, New Mexico, and Utah.

TAXONOMIC TREATMENT

Musineon naomiensis L. M. Shultz & F. J. Smith, sp. nov. (Fig. 1).— TYPE: USA, UTAH, Cache Co., Naomi Peak, Mt. Naomi Wilderness area, Bear River Range of the Wasatch Mountains, 41.9114 N, 111.6686 W, in shaded sites, crevices of limestone, SSE exposure, with *Clematis, Penstemon, Mertensia, Leucopoa kingii,* 2 Jul 2013, *Frank J. Smith 4225*, with Mike Jablonski and Jane Catlin (Holotype: UTC; isotypes: NY, JEPS).

Diagnosis. The narrowly endemic *Musineon naomiensis* has white petals 2–3.5 mm long marked with a dark red center, a compact growth form, bractlets 2–4 mm long, glabrous fruit, and a subalpine distribution (Fig. 2A). The closely related and more common *Musineon lineare* (Rydb.) Mathias has yellow petals 4–8 mm long, bractlets 4–7 mm long, scaberulous fruit, a sprawling growth form, and mid to upper montane habit (Figure 2B). In the few sites where the two species are sympatric, they remain morphologically distinct with no evidence of hybridization.

Plants caespitose perennial from a woody base, forming clumps 3–4 cm in diameter, 3–5 cm high,